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ABSTRACT

The computerized Painless Accountability System is a performance objective system from which instructional programs are developed. Three main simplified behavioral response levels characterize this system: (1) cognitive, (2) psychomotor, and (3) affective domains. Each of these objectives are classified by one of 16 descriptors. The second major characteristic of the system is that it is based on taxonomics (keyword indexes) of curriculum areas, which might appear in any K-12 curriculum. The third distinguishing feature is a coding procedure which allows an entire objective to be specified in a maximum of 30 characters. Coding of more than 100 objectives per hour is possible. Two of the significant outputs of the system are the performance objective chart, whose major function is to promote continuous curriculum development, and the Management By Objectives System (MBO) which is an economical data compiling aid for administrators in: (1) planning, (2) monitoring, and (3) evaluation. Two printouts from this processing are the Gantt Chart and the monitoring report. The cost for a school district to implement and maintain the computer program is also discussed. (BP)

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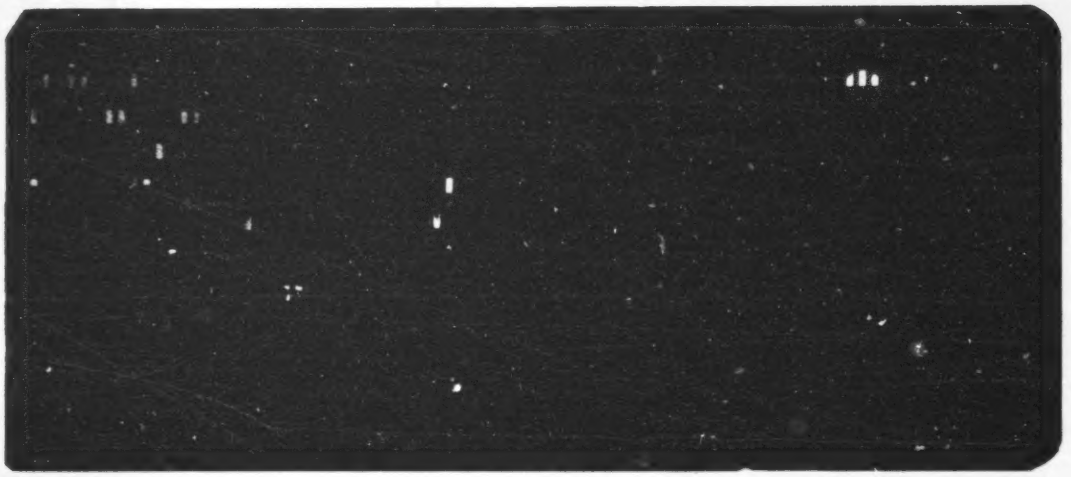
PAINLESS ACCOUNTABILITY



A performance objective, learner oriented, accountability system.

\+ A process objective, administrator oriented, accountability system.

\= A unique computerized accountability tool aimed at achieving overall school improvement.

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PAINLESS ACCOUNTABILITY

An ESEA Title III Project

The school districts of Bayfield, Durango, Ignacio, Ouray Pagosa Springs, and Silverton, Colorado are involved in this accountability project. It is only with their patience and cooperation during the development stage that we have been able to successfully meet our project challenge.

Presented at the National Educational Technology Conference
San Francisco, California, 14 March 1974
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INTRODUCTION

The reasons for accountability are quite simple. The student, parent, teacher, administrator, school board, and the entire taxpaying community all have a vested interest in knowing where education is now, where it is going, which road will take it there, and how much will the trip cost.

This accountability challenge has been much easier to throw down via legislation than it has been for educators to successfully implement the mandates of such laws.

Over twenty states have enacted some form of accountability mandate. Similar legislation is pending in many of the remaining states. These laws embody such research jargon as formative evaluation, criterrion referenced evaluation, performance objectives, management objectives, and program oriented budgeting. Both in theory and limited research projects, the practical value of these concepts has been demonstrated. However, many of these models become too cumbersome and too expensive when put to the test of broad scale application. When you try to specify the entire range of a school districts activities, both in learning and administration and then try to use this data for both short and long range planning, for periodic monitoring purposes, and for both qualitative and quantitative evaluation . . . many models simply are not economically feasible.

The San Juan Board of Cooperative Services (BOCS) anticipated the need for outside funding and had already applied for and received Title III funding for an "Accreditation by Contract" project when Colorado enacted extensive accountability laws in 1971. Since accountability was a prerequisite for "accreditation by contract" we were in a favorable position to begin meeting the mandates of the law. The six school districts associated with BOCS have provided a challenging, practical setting to pilot the development of "Painless Accountability" systems.

The BOCS accountability project was charged with three major responsibilities:

1. Districts would effectively satisfy the Colorado accountability laws.
2. Districts would attain accreditation by contract-a procedure based on planned educational outcomes rather than inputs or process.
3. Accountability procedures usable by other districts of any size would be developed.

In response to these challenges a computer based systems approach to accountability has emerged and come to be known as "Painless Accountability". It has been described by several sources as unparalleled and well ahead of the field. Admittedly, Painless Accountability is not really painless. However, if legislators and the public actually want the extensive data suggested in accountability mandates, and if the many advantages of performance based instruction and management by objectives are to be realized...the rapid, economical, and comprehensive procedure of "Painless Accountability" promises an immediate solution.

PERFORMANCE OBJECTIVE SYSTEM

The performance objective system is a learner oriented practical means to develop and implement outcome based instructional programs. The advantages of the system include:

1. An autonomous means of setting your own objectives
2. Rapid implementation and maintenance
3. Continuous modicability of objectives
4. Applicable to any educational model
5. Need horizontal and vertical clarification and communication
6. Individualized instruction facilitated
7. Objective based formative and summative evaluation
8. Economical to implement and maintain

While many models exist for writing performance (behavioral) objectives, Painless Accountability has chosen the following six part format:

1. Who is the objective intended for?
2. What is the instructional content?
3. What is the expected behavior?
4. What is the expected proficiency level?
5. What are the time constraints?
6. What is the method of evaluation?

Three main features characterize this system:

1 The use of simplified behavioral response levels in the cognitive, psychomotor and affective domains (adapted from Bloom's, Krathwohl's, and Dave's). Behavioral levels provide a comprehensive yet manageable means of consistent communication between educators. Any objective can easily be classified by one of sixteen level descriptors.

COGNITIVE DOMAIN	PSYCHOMOTOR DOMAIN	AFFECTIVE DOMAIN
1. Knowledge (K)	1. Imitation (I)	1. Receive (RC)
2. Comprehension (C)	2. Manipulation (M)	2. Respond (RS)
3. Application (A P)	3. Precision (P)	3. Value (V)
4. Analysis (AN)	4. Articulation (A)	4. Organization (O)
5. Synthesis (S)	5. Naturalization (N)	5. Characterization (CH)
6. Evaluation (E)		

2. The second major characteristic of the system is that it is based on taxonomies (keyword indexes) of curriculum areas. These taxonomies are used in specifying the content of performance objectives. They are simply comprehensive sets of categories for any content which might appear in any K-12 curriculum of any district. They have been developed by compiling and reorganizing other available taxonomies, tables of content, indexes, and suggested curricula from related texts. These taxonomies are not curriculum guides, but only a means by which the curriculum content of any district can be coded. There is no assumption that the particular curriculum of any district should include all of the contents found in the taxonomies.

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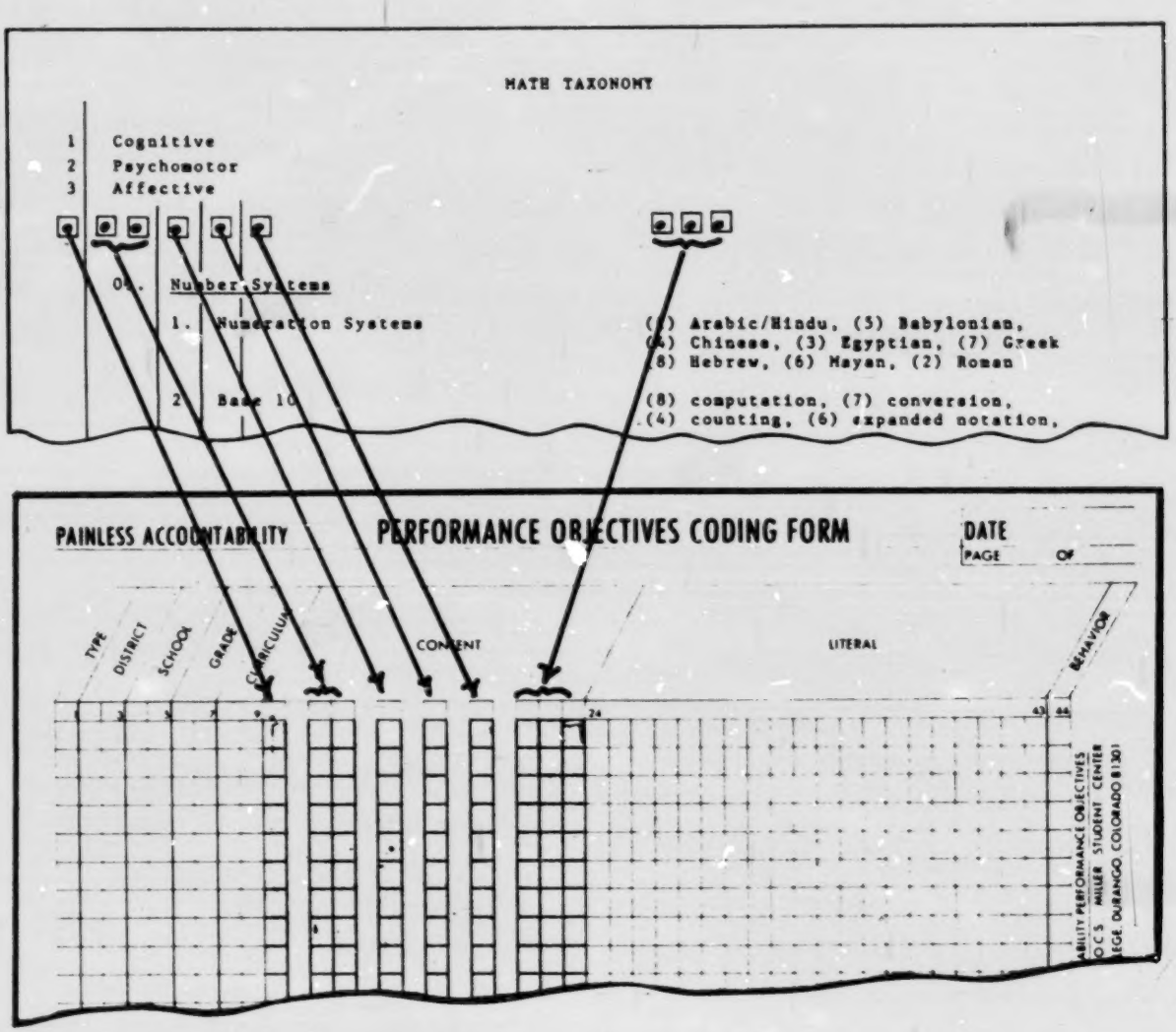
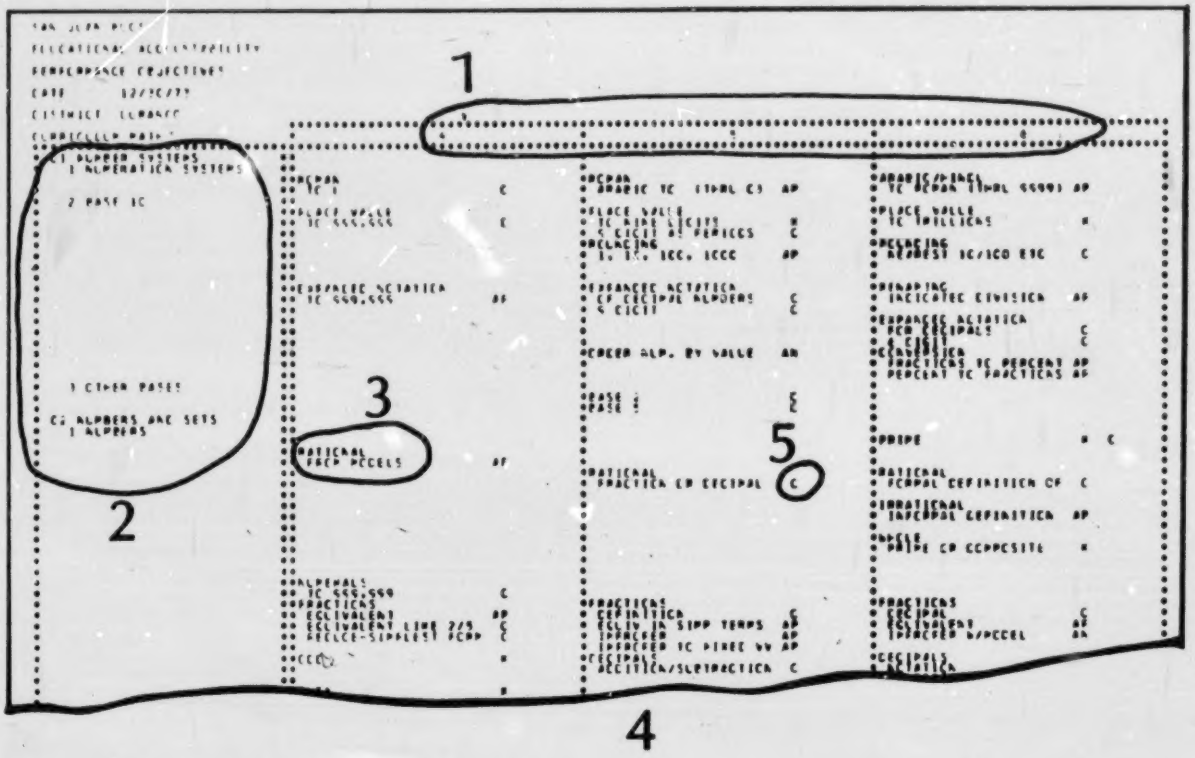
TAXONOMY CODING FORM



3. The third distinguishing feature of the "Painless" system is the use of a unique and simple coding procedure which allows time economy and reading the data for objective machine processing, advantages not shown by the typical narrative format. Use of the narrative format has typically required considerable writing time and a minimum of 20 to 30 words. The taxonomy based procedure of "Painless" allows an entire objective to be specified in a maximum of thirty characters. (The mean in the pilot districts being approximately seven characters.) Coding of more than one hundred objectives per hour is possible.

PERFORMANCE OBJECTIVE CHART



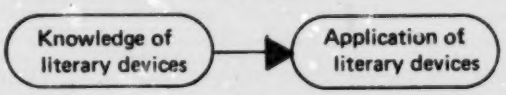
One of the more significant outputs of the system is the performance objective chart. The format of the chart is as follows:

1. Top of chart indicates grade (or mastery) levels in full school year increments.
2. The left column of the chart corresponds to the left side of the taxonomies.
3. Category printout appears only where a corresponding objective has been specified.
4. The main body of the chart consists of the actual content of all the instructional objectives specified by a particular district.
5. These abbreviations (K, C, AP, etc.) refer to the behavioral levels desired. The chart above lists mastery objectives by the grade level in which they occured for a particular district. Other districts might locate specific objectives elsewhere, or in a non-graded approach, objectives might be listed by expected accomplishment date or by some developmental sequence.

A certain progression of difficulty is expected on each chart. Objectives should build upon one another from left to right. Objectives may become more difficult in two ways.

1. CONTENT

2. BEHAVIORAL LEVEL

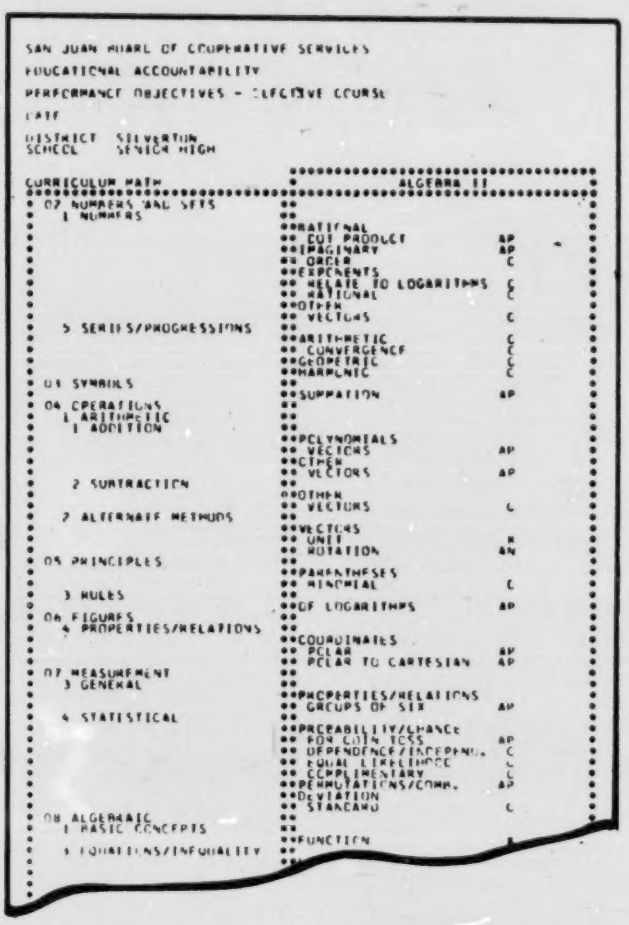


A major function of the chart format is to promote continuous curriculum development. Regularly scheduled computer runs allow modifications of a district's objectives to occur throughout the year. The chart format readily promotes needed horizontal and vertical communication.

Decisions about the adequacy of a curriculum are entirely a local matter. It is the intent of the Painless Accountability system to process local data in such a way as to facilitate local decision making.

In looking at the chart, the following things become readily apparent. Problems could include the same content appearing in two or more grade levels, a content becoming less complex or behavioral levels becoming less complex in higher grade levels. Blank fields on the chart may call attention to holes in the curriculum. Heavy loadings of low behavioral levels across the chart may indicate need of curriculum re-evaluation.

Objectives which are taught in specific courses such as Algebra I and Beginning Poetry are printed on special electives charts. The format is identical to the performance objectives charts, except that a course title replaces grade levels.


SAN JUAN REGL OF COOPERATIVE SERVICES
EDUCATIONAL ACCOUNTABILITY
PERFORMANCE OBJECTIVES - ELECTIVE COURSE
DATE
DISTRICT SILVERTON
SCHOOL SENIOR HIGH

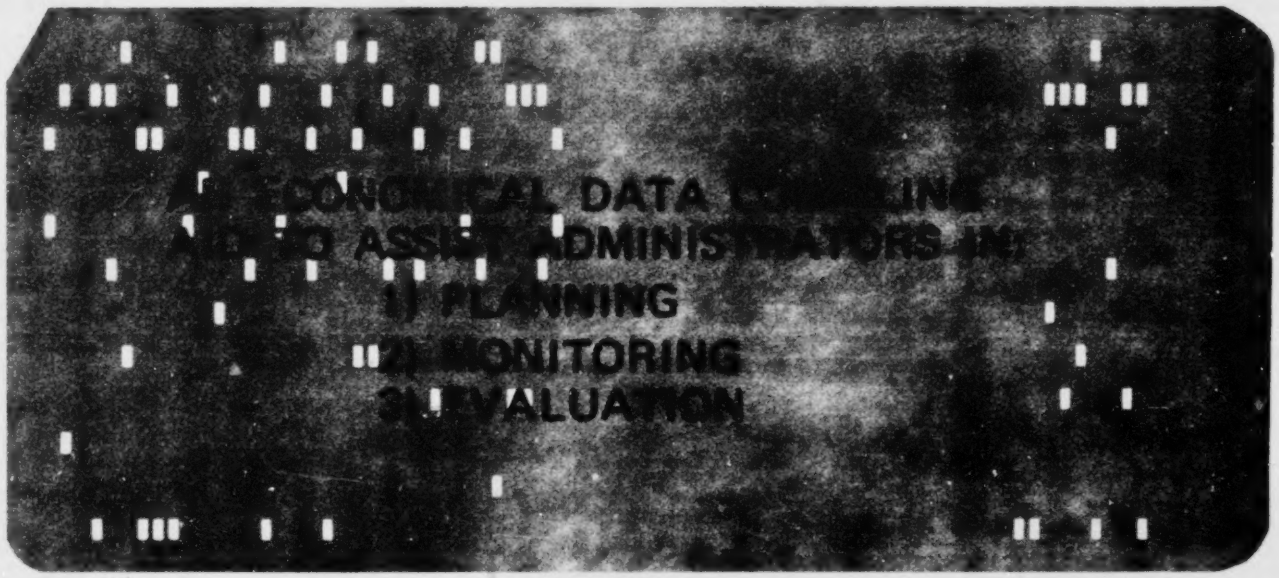
CURRICULUM MATH — ALGEBRA II

02 NUMBERS AND SETS
1 NUMBERS
RATIONAL
CUT PRODUCT AP
IMAGINARY AP
ORDER C
EXPONENTS
RELATE TO LOGARITHMS C
RATIONAL C
OTHER
VECTORS C
5 SERIES/PROGRESSIONS
ARITHMETIC C
CONVERGENCE C
GEOMETRIC C
HARMONIC C
03 SYMBOLS
SUMMATION AP
04 OPERATIONS
1 ARITHMETIC
1 ADDITION
POLYNOMIALS
VECTORS AP
OTHER
VECTORS AP
2 SUBTRACTION
OTHER
2 ALTERNATE METHODS VECTORS C
VECTORS
UNIT R
ROTATION AN
05 PRINCIPLES
PARENTHESES
BINOMIAL C
3 RULES
OF LOGARITHMS AP
06 FIGURES
4 PROPERTIES/RELATIONS
COORDINATES
POLAR AP
POLAR TO CARTESIAN AP
07 MEASUREMENT
3 GENERAL
PROPERTIES/RELATIONS
GROUPS OF SIX AP
4 STATISTICAL
PROBABILITY/CHANCE
FOR COMBINATIONS AP
DEPENDENCE/INDEPENDE C
EQUAL LIKELIHOOD C
COMPLIMENTARY C
PERMUTATIONS/COMB. AP
DEVIATION
STANDARD C
08 ALGEBRAIC
1 BASIC CONCEPTS
FUNCTION R
4 EQUATIONS/INEQUALITY

Composite charts for both the general curriculum and electives have also been developed as an outgrowth of the Painless Accountability system. All objectives, in each curriculum area, submitted by all participating districts are banked and printed out together on a single chart. These composites have been used as a basis for expanding district curricula, and can be used by a new district to begin its efforts in establishing performance objectives.

Perhaps one of the most logical and exciting extensions of this system are performance objectives based report cards. Various formats are being piloted at this time. This kind of reporting summarizes progress made by each student. Instead of a normative grade, the report describes every capability students have mastered.

MANAGEMENT BY OBJECTIVES SYSTEM



The Painless MBO system provides districts and other agencies with an efficient means of implementing management by objectives practices in education. The system is based upon budgeting categories from Financial Accounting, Handbook II, Revised.

Characteristics of this system include:

1. Inherent flexibility - allows use by any educational agency
2. Simple to implement - less than two hours of staff training time.
3. Provides complete description information - objective classification by program function and level.
4. Output allows easily interpretable monitoring of resources allocated to various objectives (hours, cost etc.).

This MBO system is based upon a four part process objective. These parts include:

1. WHO is the person responsible?
2. What ACTIVITY will be performed?
3. WHEN will the activity be performed?
4. What DOCUMENTATION will result from completion of the activity?

Management objectives are specified using a coding process. Using this process, an entire objective including the person's name, job title, district, operational unit, the function, program, level, activity, expected beginning and ending dates, actual completion dates, documentation, and expended time can be entered onto a single IBM card for processing.

All MBO data are submitted using a special form. Once a staff member has specified his MBO's, they are keypunched and computer processed. Two printouts result from this processing; the Gantt chart and the monitoring form.

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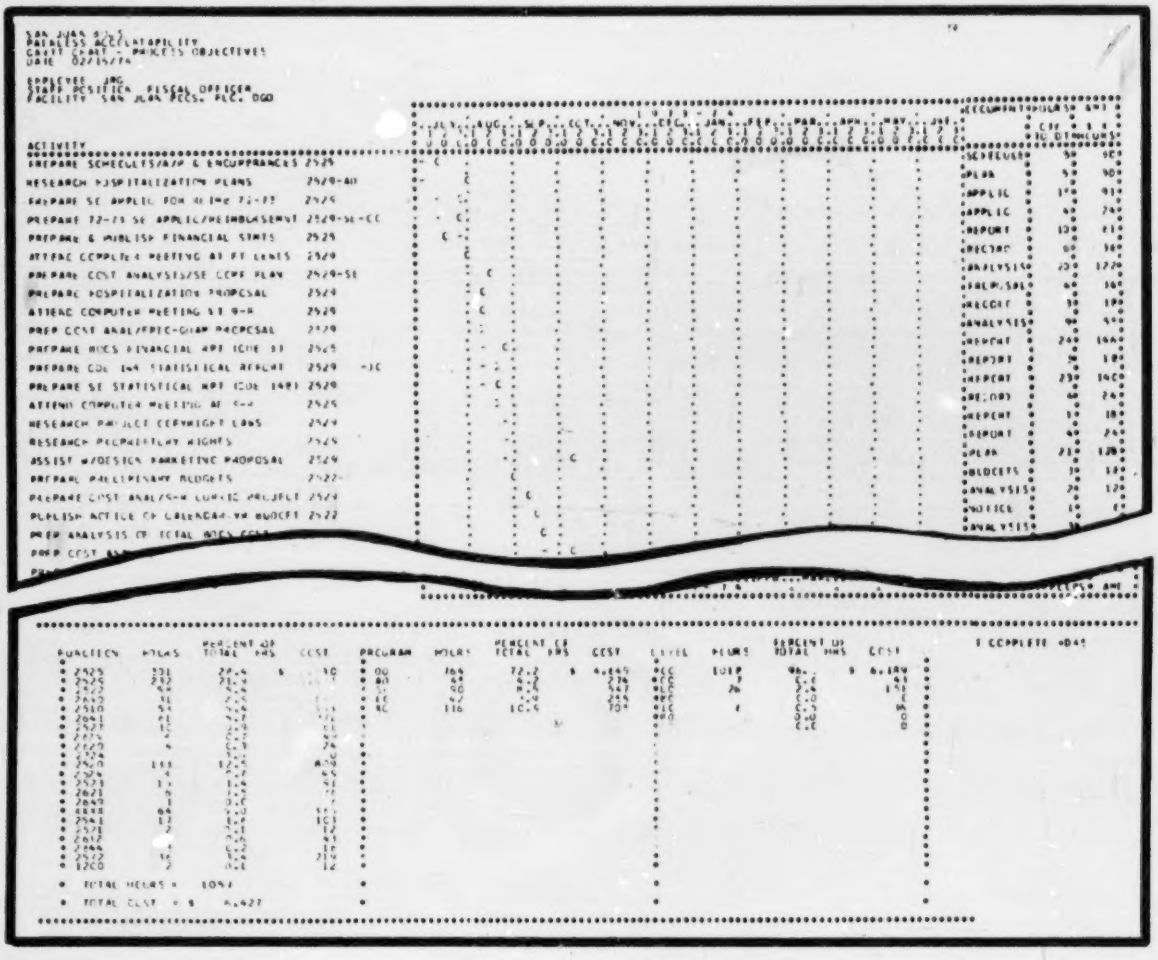
GANTT CHART - PROCESS OBJECTIVES

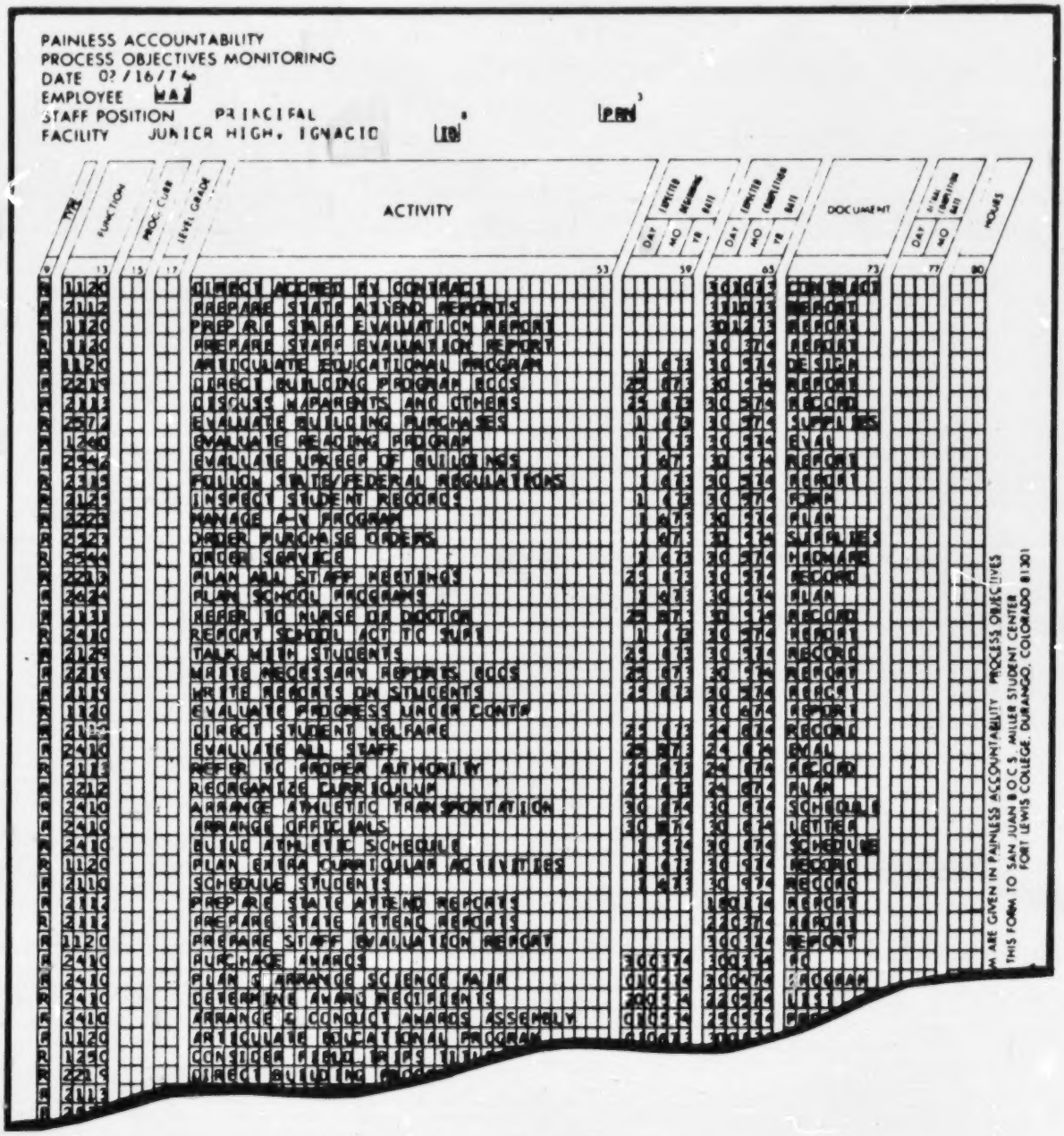
The Gantt chart format was selected as a convenient means of illustrating work loads at any given time, and to provide continuous monitoring of progress. The chart may be arranged on a five year basis to facilitate five year planning. One example of such a chart is presented below. Along the top and bottom of the chart are dates arranged by fiscal year and months in five day increments for the current year. The subsequent four years are arranged by just year and month. The left side of the chart lists the activities to be performed plus the corresponding function, program, and level. Horizontal lines in the body of the chart indicate the time estimated necessary for completing each objective. Notice that activities are sequenced by expected completion date. A column on the right indicates the kind of documentation resulting upon completion of each objective. A "C" prints on the time line wherever an activity is completed. The comulative number of hours spent to date for each activity appears in the column headed "hours". The cost per objective appears on the far right.



GANTT CHART SUMMARY

A summary report appearing at the bottom of the chart lists total hours spent, percent of total time spent, and total cost for each function, program, and level.

PROCESS OBJECTIVES MONITORING



Updating of the Gantt chart is greatly facilitate/ by the second output, the monitoring report. (See example below). All data pertaining to previous objectives not completed are repeated on subsequent reports. The "actual completion date" and 'hours' fields are always blank permitting new dates and hours to be inserted for the current monitoring period. The monitoring forms serve as the coding form by which employees can submit monthly update information for revision of the Gantt chart.

HOW MUCH DOES PAINLESS ACCOUNTABILITY COST?

A whole lot if you want to start from scratch and re-invent the wheel yourself.

Very little if you want to adopt our basic programs.

No matter what size of student body and faculty you may have . . . no matter what curriculum you may choose, Painless Accountability can work as well in New York City as it can in Bug Tussel, Texas.

PERFORMANCE OBJECTIVES SYSTEM	PROCESS OR MANAGEMENT OBJECTIVES SYSTEM	SPECIAL EDUCATION OBJECTIVES SYSTEM
DEVELOPMENT COST	**DEVELOPMENT COST**	**DEVELOPMENT COST**
Staff developmental time Taxonomies Math Language Arts Health Physical Education Driver's Education General concept of system Piloting of system in districts Manuals Forms Secretarial time EPIC workshop & other services Computer time Programmer time Administration & facilities Equipment, materials, supplies	Programmer time Computer debug time Forms Staff developmental time Pagosa workshop Piloting system & travel in districts Administration, rent, etc. Manuals Secretarial Keypunch Other materials/supplies	Staff developmental time Programmer time Computer debug time Secretary time Materials/supplies
$61,000 100%	$37,000 100%	$2,600 100%
START UP COSTS	**START UP COSTS**	**START UP COSTS**
BOCS staff time Training manuals Taxonomies Forms Keypunch cards Computer time Operator time Telephone/postage Materials/supplies Secretarial Contract development Per diem	Staff developmental time Programmer time Computer debug time Materials/supplies	Staff developmental time Programmer time Computer debug time Materials/supplies
$1,400/year 2.3%	$1,000 2.7%	$530 20%
MAINTENANCE COSTS	**MAINTENANCE COSTS**	**MAINTENANCE COSTS**
Operator time Computer time Keypunch time Secretary time Objective forms Cards	Supervision Computer time Keypunch Operator Secretary Keypunch cards Forms, cards, materials Mailing	Operator time Computer time Secretarial time Cards, forms
$200/year .3%	$142/year .3%	$128/year 5%

- These were development costs for our area of the country and our needs to service some 6,500 students.
- Your costs could vary depending on kinds of data desired, complete system or just a part thereof, population served, whether you want your own system or combine with other districts, computer time access, etc.
- For those interested in implementing "Painless Accountability," we will be happy to consult with you on your own particular needs and provide you with an estimate based on services desired.

PAINLESS ACCOUNTABILITY

SUMMARY

- The computerized Painless Accountability System introduced in this booklet operationalizes many advanced concepts for meeting both the intent of accountability legislation and the goals for achieving overall school improvement.
- An analysis of the system's output features plus an understanding for the minimal resources necessary for implementing this technology quickly reveals the many accountability advantages of electronic data processing.
- Painless Accountability is the fruitful result of years of research and development to bring about workable systems.
- Painless Accountability systems have been proven to work exceptionally well during the pilot stage in Southwest Colorado. They promise to work equally well in any school district or combination of districts throughout this country.
- During the fiscal year 1974-1975 a major emphasis will be put toward implementing Painless Accountability systems in a limited number of school districts throughout the country. If you are interested in our program, your participation is invited. If these systems can be installed as quickly and economically as we presently anticipate, then Painless Accountability will certainly have become an important contribution to modern and effective educational practices.
- But the task of Painless Accountability is far from complete. As good as it is today, we expect to add many refinements to existing systems and introduce other innovative criterion-referenced evaluation systems in the months to follow.
- Therefore, Painless Accountability is a workable system today that can provide the sound foundation for meeting future needs as well. As systems and technology become more sophisticated, your Painless Accountability system can be updated accordingly.

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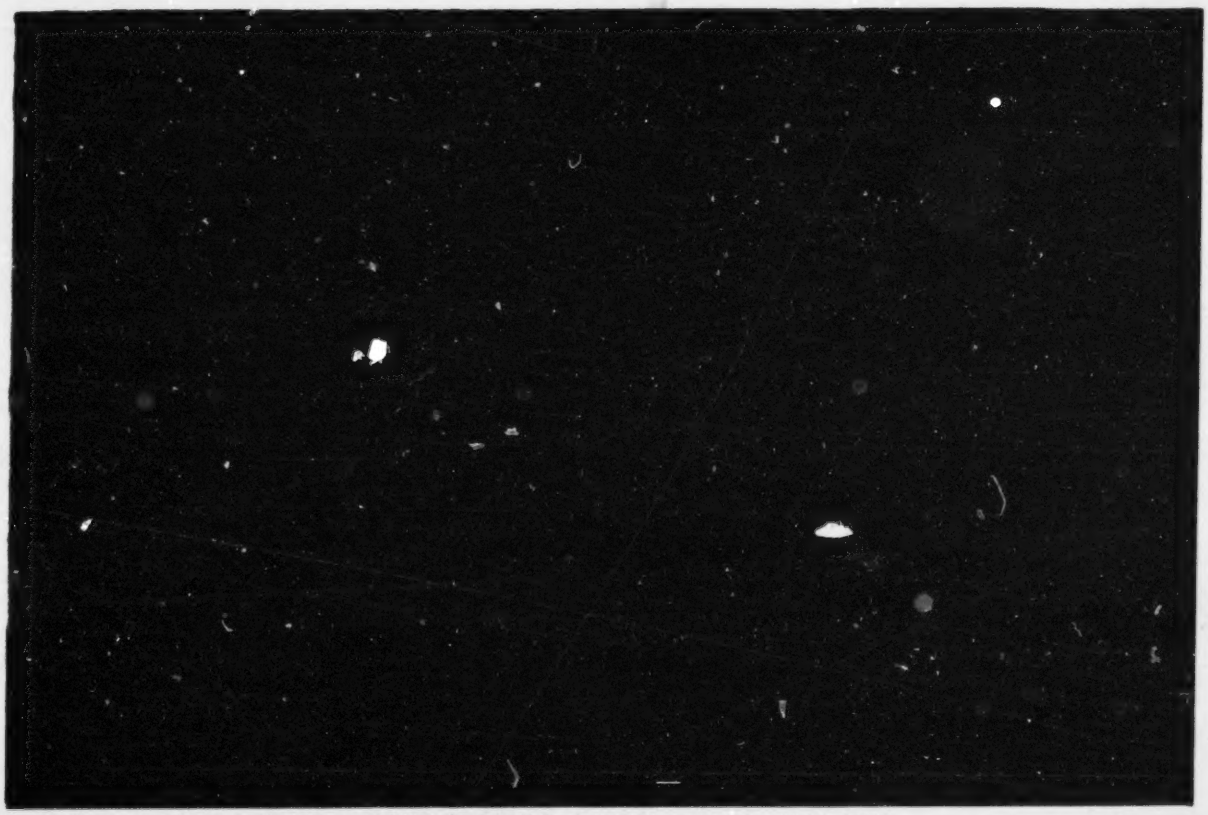

STUDENT, PARENT, TEACHER, ADMINISTRATOR, SCHOOL BOARD, TAXPAYER

A WAY TO MAKE EDUCATION WORK BETTER FOR EVERYONE.

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